AUSTRALIAN *PSYLLIDÆ*.

By Walter W. Froggatt, F.L.S.

(Plates xi.-xiv.)

Introduction.

The insects of this family of the Homoptera, like those of several other groups of the order, are very interesting because of the remarkable larval and pupal transformations they exhibit in the course of the metamorphosis, as well as for the curious protective coverings—lerps or scales—which many of the tiny larvæ commence to fabricate as soon as they emerge from the egg. The lerp or scale is added to as the insect increases in size up to that of the full-grown pupa; then crawling from beneath it, it casts the final pupal shell, and emerges as the perfect insect.

The best known Australian species are those that form the leaf manna upon the foliage of Eucalypts. As far back as 1849 Anderson (1) described the chemical composition of some "manna" (lerp) that had been obtained in the Mallee-gum scrubs in the north-western part of Victoria. This paper was reprinted by Dobson (2), who added a description of an insect which forms similar sugar-like lerp on the foliage of Eucalypts in Tasmania, under the name of *Psylla eucalypti*. He gave a careful account of the way in which the larvæ construct the scales; and he figured two other species besides the one he named.

Another interesting paper dealing with the structure of the lerp-scales was written by Wooster (3) who watched the larvæ of the same or an allied species lifting the sides of the scale while they raised the walls to form an addition to it from below.

Tepper (4) has also given a general account of the so-called "manna" upon the leaves of *Eucalyptus gracilis* and *E. leucoxylon* in South Australia.

Beveridge (5) in a paper on the Aborigines of the Lower Murray and Darling Rivers has also referred to it under the heading of "Laarp," which, he says, "is the excrement of a small green beetle wherein the larva thereof is deposited." He gives a very remarkable account of how the natives collected and fed upon the lerp-scales during the summer months; and he adds that it is so plentiful "that a native can easily gather from 40 to 60 pounds weight of it in a day." But this must be a slip, for old residents of the Wimmera, where it was very plentiful before the Mallee scrub was cleared off, have informed me that 2-3 lbs. was quite as much as any one could obtain in a day; and that the blacks used to gather it for food in winter, rolling it up in bark and hiding it in the trees; when they wanted to eat it they first moistened it with water.

Many species form regular galls and blisters upon leaves, chiefly those of Eucalypts. These first appear as little pits, which swell into either bubble-like excrescences or thickened rounded masses enclosing the larva. This emerges from an opening either on the upper or under surface of the leaf.

Others again hide under loose bark on the trunk or branchlets of a tree, enveloping themselves in a mass of flocculent matter, which exudes and forms white spots dotting the trunk all over. These species are so diligently looked after by several kinds of ants which sometimes form galleries over them that it is difficult to collect specimens.

Most of the naked species are more common upon Acacias and other scrub trees than upon Eucalypts, and swarm in such numbers on the under surface of the leaves or over the young branchlets, as at first sight to be easily mistaken for aphides.

Some of the true lerp-producing species present very curious examples of insect architecture. The lerp-scales are sometimes like little cockle shells with delicately crenulated edges, semi-transparent or opaque, black or richly tinted with yellow or red; some are smooth and flattened, others convex and covered with fine hairs; sometimes they are closely attached to the leaf, but

the more delicate ones are simply fixed to it by a hinge at the apex, the larva being free to crawl in or out.

All the lerp-scales are fabricated by the larvæ and pupæ from the excess of sap or juice sucked up through their sharp bills from the food-plant. This is ejected in small globules from the anus, but it is quite different from the excrement. It is another form of honey-dew, which when drawn out into fine threads by the feet and spun into the net-like sugar lerps, solidifies and hardens in the sun. In the naked species the larvæ expel the sap which forms a real honey-dew as in the case of the European pear-tree Psylla (*P. pyricola*), in which it is so excessive that the whole foliage and trunk of the tree become smothered with the exudation; this in turn is attacked with a fungus which covers it with a smutty black coat (fumagine) seriously injuring the tree.

The Australian fauna is very rich in species of Psyllidæ, but from their small size and active habits in a country so rich in larger and more conspicuous insects they have been naturally rather overlooked, for they are seldom to be met with except by sweeping among the brush with a net, or by breeding them from the larvæ and pupæ upon infested foliage. In the British Museum Catalogue of the Homoptera (1850-51), Walker records five species, all from Tasmania. Another species also from Tasmania was added to the list by the same author in his Descriptive Catalogue of Saunders' Collection of Insects published in 1855.

Nothing further was done until Maskell (6) published his paper on the species in New Zealand, in which he described four new species. One of these, *Rhinocola eucalypti* lives upon the young shoots of the "blue gum" (*Eucalyptus globulus*), and is common in New South Wales, so that it may have been introduced into New Zealand.

Scott studied the types in the British Museum Collections in 1882 (8), and redescribed Walker's species, *Livia longipennis*, which he placed in the genus *Creiis*. It was described from Tasmania, but I have a fine series of it both from Victoria and New South Wales. The larvæ make one of the finest golden-yellow lerp-scales.

In 1895 Tryon (9) gave a brief description of the eggs and larvæ of a species which is very plentiful in the spring and autumn upon the foliage of the "Moreton Bay Fig" (*Ficus macrophylla*). The larvæ prick the leaves with their sharp rostra, and live in social groups protected by masses of coagulated sap.

In 1898 a paper by Maskell was published shortly after his death in which three species from Australia were described (9).

The last paper dealing with Australian species is that by S. A. Schwarz (10), who redescribed Dobson's *Psylla eucalypti*, placing it in Signoret's genus *Spondyliaspis:* and added a new species.

The above is a summary of all that has been written on Australian *Psyllidæ;* but the foreign species have had many admirers, and have been well worked out.

In a group of Micro-Homoptera like the *Psyllidæ*, where the largest are hardly over two lines in length, there is a very great difference in examining carded or mounted specimens, sometimes many years old, in Museum Collections, and series of living insects of the same species, with a knowledge of their life-histories. Therefore, to describe them properly, there is no doubt that the correct mode of studying them is upon the spot and in relation to their food-plants. Fortunately they are very easily bred out, and in most cases when the food-plant is obtained specimens in all stages of development, from the egg to the perfect insect, may be found and worked out upon the same branch of foliage, the whole life-history being under review at once.

I have to tender my thanks to the following gentlemen for their kindness in sending me specimens and notes:—Messrs. C. French and C. French, Jr., of Victoria, Mr. H. Tryon of Brisbane, and Mr. A. M. Lea of Tasmania. To Dr. Horváth of Hungary and Dr. Howard of America I am indebted for papers dealing with the family, and to Mr. J. H. Maiden of Sydney for notes and papers upon the subject of manna.

Classification.

The *Psyllidæ* form a very well defined family of the suborder Homoptera, closely allied to the *Aphidæ* in habits and form. I

have one species bred from the Kurrajong (*Sterculia heterophylla*) that, on a superficial examination, is wonderfully like a green-winged aphid. In their larval habits they are much more coccid-like, and some of the lerp-scales produced might very easily be mistaken for a coccus. They seem also to have some relationship, particularly in the larval stages, with the *Aleurodidæ*. Most of the larvæ of *Aleurodes* form rounded disc-like shells or tests under which they pupate, but those of some of the Australian species pit the leaves of Eucalpyts exactly like some Psyllids; however in the adult stage *Aleurodes* shows a much closer relationship to the Coccids, and might be described as a higher type of this group, with both sexes winged, but with a very primitive venation. In the *Psyllidæ* the venation of the wings is very well-defined, and characteristic of the species. Sharp (11) places the *Psyllidæ* in the sixth family of the Homoptera after the *Jassidæ* and before the *Aphidæ*, a very natural position. In this he follows most of the later systematic entomologists who have placed them from their external characters.

A great deal has been written about the classification of the *Psyllidæ*. Réaumur named them Faux Pucerons from their relation to the *Aphidæ*. Linnæus placed them in the genus *Chermes* (now restricted to a group of the *Coccidæ*). Geoffroy, considering that the later name had been improperly used by Linnæus, gave them the very appropriate generic name *Psylla*, from the Greek for a flea, in reference to their jumping powers.

A number of later papers were written in which *Psyllidæ* were described, but it was not until 1848 that any regular classification of this family was undertaken. In this year A. Förster (12) defined the different genera, added several new ones, redescribed the old species, and described a great number of others. Dr. Franz Löw has been one of the most prolific writers upon this family. In 1878 (14) he divided them into four subfamilies; and in 1882 (15) he published a complete revision of all the described palæarctic species, with their synonomy, followed by a catalogue thereof in the same year, in which he listed over 170 species (16).

Most subsequent writers have followed Löw's classification. In the same year Scott (18) formed a fifth subfamily for Walker's two genera *Carsidara* and *Tyora*.

The members of the family have a wide geographical range. Europe is particularly rich in numbers; Southern Asia and the Northern parts of Africa have a fair supply. Riley and some of the earlier writers have described the North American species, and Scott several from South America. Buckton has dealt with three from India, and Schwarz with one from Japan. They appear to be more numerous in temperate climates, or dry semi-desert lands, than in the tropics, and the dry open ranges of Australia covered with stunted Eucalyptus shrubs are very rich in species.

The eggs are either bright yellow or brown, sometimes scattered all over the foliage; at others, particularly in the case of the lerp-producing species, clustered together in irregular rows from ten to forty in number. Their form is generally elongate-oval, sometimes pointed at the extremities; and sometimes there is a slight keel down the centre of the dorsal surface. The shell splits down the centre when the tiny larva emerges.

The larva is generally pale yellow, elongate in form, with the head and the abdomen rounded at the extremities; the antennæ short, stout, and pointed at the tip; the eyes red, small, and irregular in form; the legs stout and long, with the digitules of the tarsi long. During its successive moults it may change its colour several times; a bright yellow larva frequently changes to bright green or red before its final moult into the full grown pupa; the indications of the fuscous-brown or black dorsal marks become more distinct and defined at each ecdysis, so that these graduations of colour become very interesting to the observer. Several writers have noticed this variation of colours. Réaumur observed it as far back as 1773 (17), when studying species. The larva at a very early stage of development shows two rounded pads or projections upon the sides of the thoracic segments, which afterwards form the wing-covers of the pupa, the transformations being so gradual that it is difficult to define the borderland

between the larva and pupa, or where one stage ends and the next commences. In dealing with their development, when all stages have been obtainable, I have taken the smallest form to be found as the larva, and defined the pupa from the largest, frequently just as it is ready to cast its skin and emerge as the perfect insect. Though the changes are gradual, each moult brings some alteration; first, the abdominal segments show the line of separation from the thorax, next the line between the base of the head and thorax, and the enlargement of the wing-covers. The antennæ, though not increasing much in length, show more joints; in the earlier stages the 3rd joint is very long, and the additional joints, until the normal number of nine is reached, appear to divide off from the apical portion of the elongated third joint, which, however, is generally the longest in the perfect Psylla. Many of the larvæ and pupæ are covered with fine hairs; most of the species that are naked (not forming lerps or galls) have the hairs upon the dorsal surface covered with tiny particles of white sugary secretion, with those on the sides converted into white filaments sometimes of considerable length.

The perfect insect might be compared to a minute cicada in general form, but there the actual resemblance ends. The head is generally broader than long, sometimes deflected, with large eyes; the ocelli three in number, the lateral ones placed on the summit of the head close to the hindmargin of the eyes, and the central one at the lower margin at the apex of the median suture. The face lobes are generally hairy, sometimes long and projecting in front of the head; in some species angular, rounded, short or ribbon-shaped and almost hidden; or exceptionally wanting in some groups; the form of the processes seems to be of considerable generic value. The antennæ are composed of ten joints, the first two shorter and thicker than the remaining generally filiform ones, and terminating at the apex with two short setæ.

The thorax is broad, the pronotum narrow, with the mesonotum divided into three unequal parts—the first the dorsulum, the second the mesonotum proper, large and broad, and the third or

scutellum rounded. The wings are fully developed in both sexes; the elytra or forewings longer than the abdomen, with stout nervures, the costal with or without a stigma; the venation is simple and constant, and of both generic and specific value. From the primary vein run the radius parallel with the costal, the cubitus which branches into an upper and lower arm, each again bifurcated into a more or less regular cell at the apex; the cubitus with or without a petiole; the hindwings simple. The legs are formed for jumping; the coxæ of the hind pair armed with a rounded spine; the apex of the tibiæ of the hind legs armed with a fringe of fine spines; the tarsi two, with large double claws. The abdomen is composed of six segments. The genitalia of the male comprise an upper and lower valve, two curved processes known as the forceps, and an enclosed penis. The female genitalia consist of two more or less elongate valves enclosing the ovipositor. The form and structure of the genital organs are also of use for specific characters, and are constant in each species.

The colouration and size are not constant. Löw says, with reference to the European species (18), that not only are there differences in the colour according to the age of the insects, but the same species on a different food-plant varies; and that the successive generations change with the seasons in both particulars. In Australian species so far I do not find any perceptible difference in the successive broods (many of which live all through the year), probably on account of the comparatively uniform climate; but the colouration is very variable in some species, particularly in those hiding under bark or crawling upon the foliage in their larval state, while the males are often the smallest. Though some do not vary in the least, being distinctly marked when they emerge from the pupæ, others often take several days to attain the dark markings upon the wings, and these vary and fade away to the faintest tinge of brown in individuals of the same brood; pale yellows become ochreous, and browns black. After a time many of the richest colours fade or change into darker tints.

All the species that I have examined appear to fall very naturally into the subfamilies defined chiefly upon the structure of the wings by F. Löw. Those forming lerp-scales or hiding under bark are referable either to the *Liviinæ* or *Aphalarinæ;* most of those living among flocculent matter upon foliage or forming rudimentary lerps to the *Psyllinæ:* and all the true gall-producing species (with a few exceptions) to the *Triozinæ*.

I have not proposed new genera for any species that I could at all reasonably refer to genera already well-defined; and if I have erred on the side of caution, specialists will be able to rectify this defect. This course appears to be preferable to forming new genera on such scanty material, as has been done in the past: one of Walker's genera, for instance, being based on the examination of a single specimen minus the head.

In a large series of specimens one frequently meets with examples possessed of an extra cell or cross nervure in the wings; such, if examined alone, would certainly not fit the genus to which the species belongs. It also appears to me that some of the latest genera established by Riley and others are so minutely defined that they can only take in the single species upon which they are founded, whereas if they had received more general treatment they might have included all allied forms.

In Schwarz's paper (10) he discusses the position of the genus *Spondyliaspis*, to which he refers the typical lerp-producing species, *Psylla eucalypti*, Dobson; and he comes to the conclusion that "the peculiar structure of the hind tibiæ and tarsi possesses more than a generic value"; and he accordingly proposes a new subfamily, *Spondyliaspinæ*. But as all the subfamilies previously established have been defined almost entirely upon the structure of the fore-wings, I should prefer to see it remain in the *Aphalarinæ*.

The following comprises a list of the genera placed in the first two subfamilies.

Family PSYLLIDÆ, Latr.

i. Subfamily LIVIINÆ, F. Loew.

Front of head not produced into conical processes; eyes not prominent. Stalk of cubitus shorter, as long as, or longer than

lower branch of cubitus; upper furcation very long and narrow; upper fork of lower branch of cubitus very long, more than twice as long as lower fork.

Genus i.—Livia, Latr., Hist. Nat. Ins. Vol. xii. p. 374, 1804 (*Diraphia*, Illig.).

ii.—Creiis, Scott, Trans Ent. Soc. Lond. p. 462, 1882.

iii.—Lasiopsylla, n.g.

Genus Creiis, Scott.

Head: crown down the centre more than half the breadth between the eyes. In front of each eye a short angular tooth, front margin convex. Front lobes long, stout, vesicate. Antennæ long, slender. Eyes viewed from above hemispherical, placed on the side of the head.

Thorax: pronotum narrow, widest at lateral margins, within which is a small fovea; dorsulum moderately convex; mesonotum of an irregular hexagonal shape. Elytra elongate, rounded at apex; radius joining marginal nerve before apex, furcations of cubitus elongate.

Type *Livia longipennis*, Walker.

C. longipennis, Walker.

(Plates xi., fig. 1; xii., fig. 17; xiv., fig. 8).

Livia longipennis, Walk., B.M. Cat. (Homoptera) p 910, 1851; *Psylla livioides*, Walk., Ins. Saunders. Homop. pt. iii. p. 111; *C. longipennis*, Scott, Trans. Ent. Soc. Lond. 1882, pt. 3, p. 463.

Lerp formed upon the leaves of *Eucalyptus* sp., not more than one or two upon a leaf, rich canary-yellow, attached to the leaf by a regular flange from which it swells out, lobed on either side to a broadly rounded apex, convex, the edges in contact with the leaf somewhat flattened; formed of opaque threads running from the flange in a crescent pattern so close as to give it a granulated appearance, but the whole of the upper surface thickly clothed with long hair-like filaments, giving it a very beautiful appearance; the outer hairs easily abraded, and many specimens are more

or less denuded of the outer covering. Diameter through centre 5, across 6, height above surface of leaf 1 line.

Larva and *pupa* unknown.

Imago.—Length ·27 inch, antennæ ·13 inch.

General colour red, eyes dark brown, apex of central abdominal segments on dorsal surface banded with black, lower portion of genitalia yellow; wings pale brown, semiopaque, coriaceous and very finely wrinkled, nervures red. Head small, deeply cleft in front, with a median suture and shallow fovea on sides, truncate behind base of antennæ; a small angular tooth in front of eyes, arcuate behind. Face lobes large, rounded at apex and clothed with grey hairs. Antennæ very long, cylindrical, 1st and 2nd joints short and rounded, 3rd long, 4-5th shorter, 6th-8th longer, 9th short, 10th very short and rounded at tip. Eyes rounded on outer margins: ocelli—central ocellus large, oval, at apex of median cleft; lateral ocelli large. Thorax: pronotum narrow, depressed on sides; dorsulum large, rounded on both sides, coming to a point on sides; mesonotum very large, depressed in centre, swelling out on sides, with the scutellum almost cordiform. Legs short and stout. Wings thrice as long as broad, rounded at apex; primary stalk rather short, stalk of subcosta short; costal cell elongate, with a second or false costal nervure running to base of stigma in a line with the outer one; stigma small, running out into costal nervure; radius long, not reaching apex of wing, curving upward at extremity: stalk of cubitus longer than stalk of subcosta, upper branch long, upper and lower forks long, the latter coming down below apex of wing; lower branch of cubitus long, upper fork long, lower fork turning down. Clavus stout, clavical suture distinct. Genitalia (♂) large; lower genital plate angular, forceps small and shaped like half a lobster's claw, with the point turning upward; penis large, upper genital plate broad at base, reaching beyond tip of forceps and truncate at tip.

Hab.—Tasmania (one specimen; C. Hedley); Melbourne, Vic. (four specimens; C. French); Armidale, N.S.W. (two specimens; R. Etheridge, Jr.).

This is not a common species, and individuals are generally found singly upon leaves. Walker's two specimens in the British Museum come from Tasmania. Mr. Lea has lately sent me several worn lerp-scales from the neighbourhood of Hobart. When fresh the lerp is one of the most beautiful Australian forms, but the thick covering of filaments soon wears off when exposed to the weather.

Genus Lasiopsylla, n.g.

Head similar to that of *Creiis*, with a short tooth on sides of eye, and long slender antennæ. Thorax large, convex; pronotum short, sharply rounded in front; dorsulum large, arcuate in front, broadly rounded on sides. Wings nearly thrice as long as broad, with an inner or false costal nervure running close and parallel to costal nervure, merging into it at shoulder; stigma wanting; radius short, nearly straight, stalk of subcosta a little shorter than stalk of cubitus; upper fork of lower cubitus very long, curving in at centre. Apex of hind tibiæ dilated, and bearing three fine black spines on the edge.

Lasiopsylla rotundipennis, n.sp.

(Plates xi., fig. 2; xii., fig. 4; xiv., fig. 11).

Lerp.—Large, flattened, thin white scales, up to nearly $\frac{1}{2}$ inch in diameter, irregularly rounded, arcuate at the hinge, attached to the leaf by a small hinge from which the scale grows in concentric rings, giving it a reniform shape; convex in centre, with outer margin pressed close to the leaf; on the leaves of *Eucalyptus melliodora*, *E. polyanthema* and several other allied species; sometimes single or half a dozen overlapping each other.

Larva.—General colour dull yellow, tinged with pink on abdomen and legs; antennæ barred with black; two large blotches on head, and a double row of impressed black spots running to tip of abdomen where they come to a v-shaped point; anal tubercle black. Head truncate, slightly rounded in front, forming with thorax a solid piece widest at base of abdomen; eyes very small;

antennæ very slender, short, mottled with black. Abdomen flat, swelling out from base, broadest in centre, outer edges of segments rounded; anal tip pointed.

Pupa.—General colour pale sea-green with blotches on head, two smaller ones in front; legs, antennæ, two spots at hind margin of head, and those on the thorax and abdomen as in larva black. Head large, lobed in front, arcuate behind; eyes swelling out, rounded behind; antennæ very long, curving round and tapering to tips, 1st-2nd joints short, stout, 3rd long, slightly elbowed; eyes projecting, slightly rounded. Thorax long, wing-cases large; legs long and stout. Abdomen as in larva.

Imago.—Length ·23 inch, antennæ ·09 inch.

General colour yellowish-brown deeply tinted with pink; antennæ reddish, with the apex of each of the last 8 joints dark brown; face red, shaded on the outer margin with chestnut; eyes dark reddish-brown: segments of thorax dull red shaded with pale brown, segmental divisions black, the red replaced in male both on head and thorax with black: legs yellow, tarsi brown; wings semiopaque, coriaceous, the apical portion in female thickly clouded or mottled with fuscous, nervures red; abdomen beautifully barred with red, edged on either side with green and a fine black band below. Head large, truncate in front, with a deep cleft in centre and a fine median suture with a broad fovea on either side; forehead folded above, sloping down on either side behind antennæ, arcuate behind. Face lobes short and broad, fringed with fine grey hairs. Antennæ long, slender, 1st and 2nd joints stout and broad, 3rd longest, 4th shorter than 5th and 6th, 9th very short, 10th not more than half as long, very small and truncate at tip. Eyes very large, occupying the whole side of head, angular on inner margins: ocelli—central ocellus very small, lateral ocelli large, bright red close to hind margin of eye. Thorax: pronotum rounded in front, arcuate behind, curved and rounded at extremities behind eyes; dorsulum short and broad, rounded in front, the side angular, with hind margins truncated; mesonotum very large, with a slight angular point on sides sloping

back to scutellum, truncate at apex; scutellum large, truncate in front, rounded behind. Legs long, femora of forelegs very stout and thickened; tarsi long. Wings large, very long, over thrice as long as broad; costal nervure rounded at base, slightly hollow in centre and curving round at tip to hind margin of wing, which is nearly straight; primary stalk long and stout; stalk of subcosta shorter than stalk of cubitus; costal nervure double at base, but without any true subcostal cell or stigma; the costal cell long and slender, tapering out into a tail between costal and subcostal nervures; radius long, turning up at tip of wing; stalk of cubitus longer than stalk of radius, upper branch short, bifurcated about centre of wing, upper and lower forks of equal length, running out at tip of wing and forming a very elongate slender cell; lower branch of cubitus shorter than upper, upper fork very long, curving down before reaching tip of wing; lower fork transverse, running out at a sharp point; clavus very thick and short, clavical suture running through centre of the long, slender, anal cell. Abdomen stout and rounded to tip. Genitalia (♂) short and broad; lower genital plate short, angular; forceps oval; penis hidden; upper genital plate long, slender: (♀) upper and lower genital plates short and pointed, clothed with fine hairs.

Hab.—Melbourne (on *E. melliodora*; Mr. C. French, Junr.), and Bendigo, Vic. (on *E. polyanthema*; W. W. Froggatt); Hobart, Tas., (lerp only, on *E.* sp.; Mr. A. M. Lea); Bathurst, and Tumut, N.S.W. (on *E. melliodora*, and *E. polyanthema*; W. W. Froggatt); Brisbane, Q., (lerp only, on *E.* sp.; Mr. H. Tryon).

This is a very common species where the particular species of Eucalypts enumerated grow, and has a very wide range over the eastern portion of Australia. I have seen bushes about Bathurst covered with the white lerp-scales in the early summer. I have another form of the lerp collected on the foliage of a low scrub Eucalypt growing on the river flats near Bourke, Darling River, that has puzzled me very much, for though I can see no specific differences in the pupa or perfect Psyllid, yet the lerp-scale, while of the same colour and shape as the more common coastal species, is

quite different in its structure. Instead of being formed in concentric rings, it is made up of close delicate parallel bars, which run from the base to the outer margins, giving it a beautifully striated appearance.

Lasiopsylla bullata, n.sp.

(Plates xi., fig. 3; xii., fig. 16; xiv., fig. 15).

Lerp.—Thin bubble-like galls or excrescences upon the upper surface of the leaves, produced by the attacks of the larvæ on the under surface of the leaves of several species of Eucalypts; narrow and constricted at base, but swelling out in an elongate-oval or rounded gall, from 4-8 lines in height and 4-5 in diameter; very variable in shape, and from 1-12 on a single leaf; when fully developed the general green colour is frequently brightly tinted with red and yellow. Basal orifice large, but closed with a circular cake of saccharine matter; the small larva crawls about in its spacious chamber until nearly ready to pupate; then it is enveloped in a mass of white flocculent wool, though in its earlier stages quite free from such filaments.

Larva bright canary-yellow, legs and antennæ semitransparent, eyes bright red, the dorsal surface showing traces of the fuscous marking of the pupa. Head short, broad, rounded in front, antennæ very long and stout, clothed with coarse hairs. Thorax short, broader than head; legs stout, covered with coarse hairs. Abdomen long, rounded and coming to a rather slender point, lightly clothed with coarse hairs.

Pupa dull ochreous-yellow, apical portion of thorax and abdomen pale green; dorsal surface of head, wing-covers, centre of thorax, and a double row of spots on abdominal segments fuscous. Head rounded; antennæ very long, of a uniform thickness, curving round to shoulders, pointed at tips; eyes large, not projecting. Thorax very broad; wing-covers large, long, rounded at tip. Abdomen short and broad, constricted at base, rounded to anal tip.

Imago.—Length ·26 inch, antennæ ·07 inch.

General colour light chestnut and bright yellow; wings coriaceous, light brown, with reddish-brown nervures; clavical suture bright pink, giving it a very distinctive appearance. Head small, curving down in front, truncate at base, deeply cleft in front, rounded to eyes, with a median ridge and large shallow depression on either side. Face lobes short and broad, rounded and clothed with long grey hairs. Antennæ long, slender, springing from below inner margin of eye; 1st-2nd joints very short, 3rd very long, 4th-9th slender, uniform in length, 10th short and slightly thickened at tip. Eyes large, reddish-brown, not projecting: ocelli large, central ocellus at the apex of frontal cleft, lateral ocelli close to hind margin of eyes. Thorax: pronotum very small, convex in front; dorsulum hexagonal, convex on summit, rounded at apex; mesonotum deeply arcuate in front, large, rounded on sides and behind. Legs short and thick. Wings thrice as long as broad, rounded to tip, but sharply turned down and somewhat straight on hind margin; primary stalk straight, rather short; stalk of subcosta shorter than stalk of cubitus; a distinct false or second costal vein running from base to apex of subcosta, forming a thickened costal band tapering to tip; stigma wanting; radius slightly curved upwards, not reaching extreme tip of wing; upper branch of cubitus short; upper and lower furcations very long, of equal length, forming a narrow uniform cell, and slightly curved up at tips, lower branch nearly as long as upper, upper fork very long, curving down in centre, rounded at tip; lower fork long, sloping inwards; clavus stout, clavical suture very distinct, bright red in sunlight. Genitalia (♂): lower valve short and angular; forceps arcuate on outer edge, coming to a point at apex; upper genital plate large, flask-shaped, swollen and rounded, apex nipple-shaped.

Hab.—Sydney (on *E. capitellata*) and Mittagong, N.S.W. (on *E. dives;* W. W. Froggatt).

This is a very remarkable Psyllid, allied to *Creiis longipennis*, but with the wing of a distinctly different shape. The larvæ living in the leaf-galls are quite different from the shield-shaped